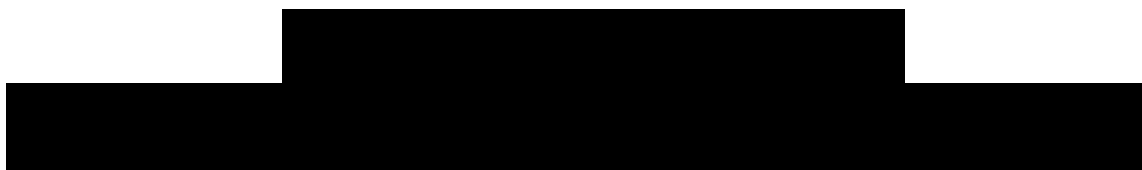


Exhibit D



TQ Delta, LLC
v.
CommScope Holding Company, Inc., CommScope Inc.,

Direct Examination of Prof. Vijay K. Madisetti

008 and 835 Patent Infringement Analysis

'008 Patent Infringement Analysis

14[Preamble] – A multicarrier system including a first transceiver that uses a plurality of carrier signals for modulating a bit stream, wherein **each carrier signal** has a **phase characteristic** associated with the bit stream, the transceiver capable of:

“phase characteristic(s)”:

“one or more values that represent the **angular aspect of a constellation point**” [Court’s Construction]



VDSL2 Standard

EX 34: G.993.2 (12/2011) at 261

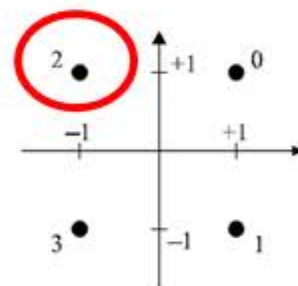
Table 12-68 –Bit mapping for R-P-MEDLEY with two bytes per DMT symbol

Subcarrier index	Constellation point
5, 10, 15, ..., $5n$, ...	00
1, 11, 21, ..., $10n + 1$, ...	SOC message bits 0 and 1
2, 12, 22, ..., $10n + 2$, ...	SOC message bits 2 and 3
3, 13, 23, ..., $10n + 3$, ...	SOC message bits 4 and 5
4, 14, 24, ..., $10n + 4$, ...	SOC message bits 6 and 7
6, 16, 26, ..., $10n + 6$, ...	SOC message bits 8 and 9
7, 17, 27, ..., $10n + 7$, ...	SOC message bits 10 and 11
8, 18, 28, ..., $10n + 8$, ...	SOC message bits 12 and 13
9, 19, 29, ..., $10n + 9$, ...	SOC message bits 14 and 15

NOTE – The byte is given as (b7, b6, b5, b4, b3, b2, b1, b0), where b7 is the MSB and b0 is the LSB. Mapping, e.g., “SOC message bits 0 and 1” to subcarriers $10n+1$ means that the two-bit value (b1,b0) shall be used to determine the constellation point in accordance with the encoding rules given in clause 10.3.3.2. This constellation point will then be scrambled using the quadrant scrambler described in clause 12.3.6.2.

Each
Carrier Signal

Phase
Characteristic



'008 Patent Infringement Analysis

14[b] **computing** a phase shift for each carrier signal **based on the value associated with that carrier signal;**

“computing a phase shift for each carrier signal”:

“computing the amount by which a phase is adjusted for each carrier signal” [Court’s construction]



VDSL2 Standard

EX 34: G.993.2 (12/2011) at 263

12.3.6.2 Quadrant scrambler

The constellation point of each subcarrier shall be pseudo-randomly rotated by $0, \pi/2, \pi$ or $3\pi/2$ depending on the value of a 2-bit pseudo-random number. The subcarrier with index 0 (DC) shall not be rotated. The rotation shall be implemented by transforming the (X, Y) coordinates of the constellation point as shown in Table 12-70, where X and Y are the coordinates before scrambling:

Table 12-70 – Pseudo-random transformation

d_{2n}, d_{2n+1}	Angle of rotation	Final coordinates
0 0	0	(X, Y)
0 1	$\pi/2$	$(-Y, X)$
1 1	π	$(-X, -Y)$
1 0	$3\pi/2$	$(Y, -X)$

value

computing

phase shift

